

Implementation Plan for the North and Middle Fork of the Owyhee River



**Compiled by the Idaho Department of Environmental Quality
In association with the Bureau of Land Management,
Idaho Department of Lands, Idaho Soil Conservation Commission, and the North
& Middle Fork Owyhee Watershed Advisory Group**

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Introduction

In 1998, seven water bodies within the North and Middle Fork Owyhee River basins were classified as water quality limited due to excessive sediment, high temperatures, and flow modification under §303(d) of the Clean Water Act. These water bodies include Middle Fork Owyhee River; North Fork Owyhee River; Squaw Creek; Cabin Creek; Corral Creek; Noon Creek; Juniper Creek; and Pleasant Valley Creek. The North and Middle Fork Owyhee Subbasin Total Maximum Daily Load (TMDL) was developed by Idaho Department of Environmental Quality (IDEQ) and approved by the U.S. Environmental Protection Agency (EPA) in late 1999. The TMDL is available from the IDEQ for reference and review. The IDEQ is required to develop an implementation plan (Plan) which when implemented will control future and existing high stream temperatures resulting from human activity. This Plan deals specifically with the predominant anthropogenic (i.e., human) cause of the high stream temperatures, which is due to the increase in net radiation.

The Plan will list activities, which are to be implemented by land managers and private landowners within the subbasins to enhance the water quality of the North and Middle Fork Owyhee hydrologic unit. The Plan will include specific actions to meet the TMDL targets and a schedule for implementation of each activity. Important elements of this Plan will be:

- X A description of pollutant control actions (Best Management Practices);
- X A schedule of actions with interim milestones;
- X A discussion of reasonable assurance;
- X A description of legal authorities for control actions;
- X An estimate of when water quality standards will be attained;
- X A monitoring and/or modeling plan to determine effectiveness of controls;
- X Measurable interim milestones for water quality; and
- X A description of the process for revising TMDL if milestones are not being met.

Background

The North and Middle Fork Owyhee River drainages (Figure 1) are located within one fourth field hydrologic unit in southwest Idaho (HUC 17050107). The North and Middle Fork Owyhee Rivers generally drain west from Idaho into Oregon from the South Mountain and Juniper Mountain areas of the Owyhee mountain range. These drainages are located approximately 90 miles south of Boise, Idaho. Other landowners (Figure 2) include privately owned ranches and lands managed by the Idaho Department of Lands (IDL). Table 1 illustrates the inventory of private lands within the North and Middle Fork Owyhee River subbasins.

Table 1. Private Agricultural Lands Inventory

Inventory - Farms and Cropland	North and Middle Fork Owyhee River Subbasins
Number of Farms	8
Acres of Farm Land	33,688
Average Size of Farm Land	4,211

Subbasins Description

The North and Middle Fork Owyhee River subbasins are located within the northern portion of the Owyhee Mountains in southwest Idaho (Figure 3). This area lies within the Columbia Plateau, an elevated plateau with mountains separated by canyons draining generally northwest via the Snake and Columbia Rivers. This broad regional landform and vegetative classification is known as the Intermountain Sagebrush Province/Sagebrush Steppe Ecosystem.

Land uses include grazing with some irrigated hay production by a few private landowners. Recreation uses include day hiking, backpacking, fishing, and hunting. No urban areas or permitted point source dischargers are located within the North and Middle Fork hydrologic unit. No major urban areas and no permitted point source dischargers are located within the North and Middle Fork subbasins. Aquatic life includes redband trout, suckers, sculpin, redbelt shiners, dace, river otter, and beaver.

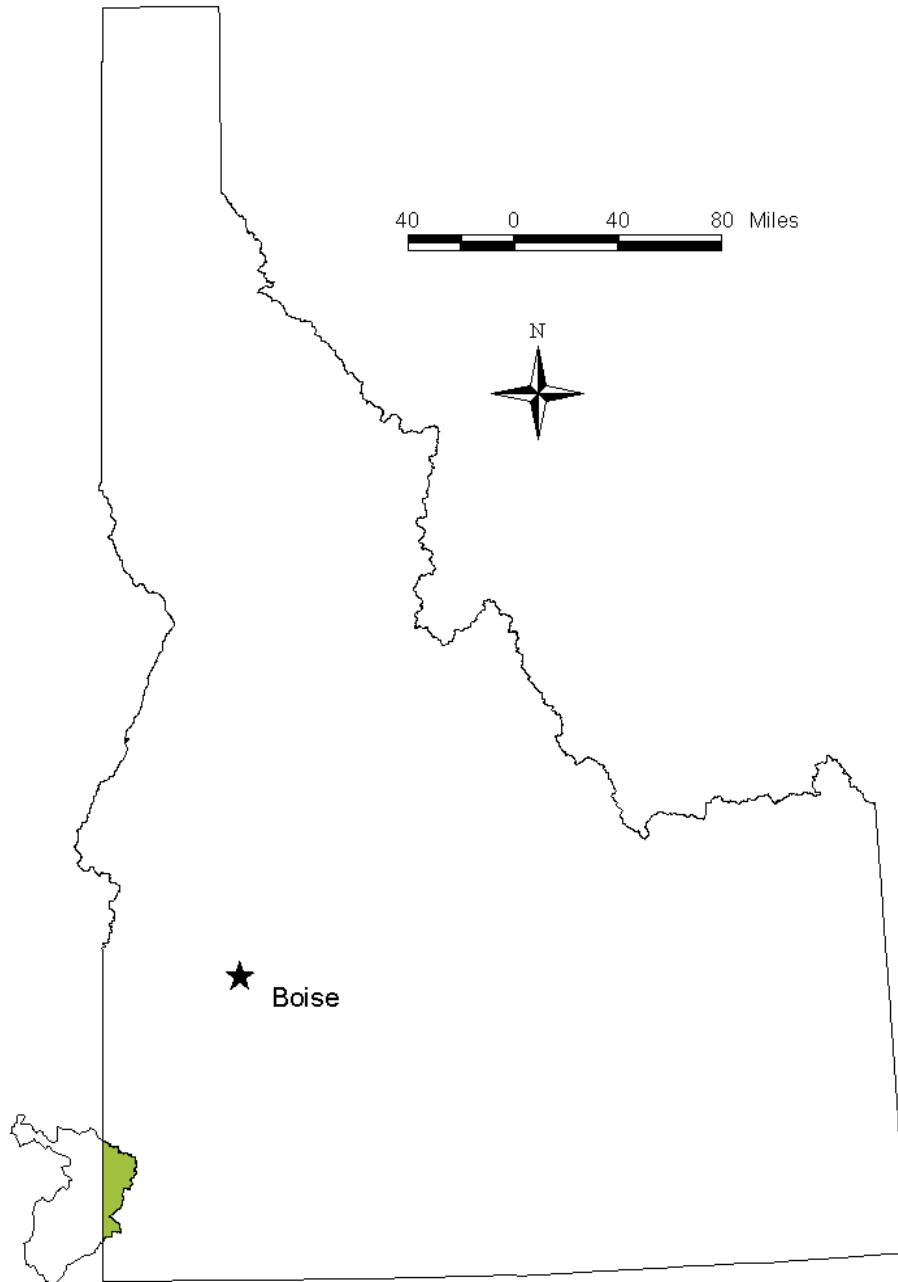
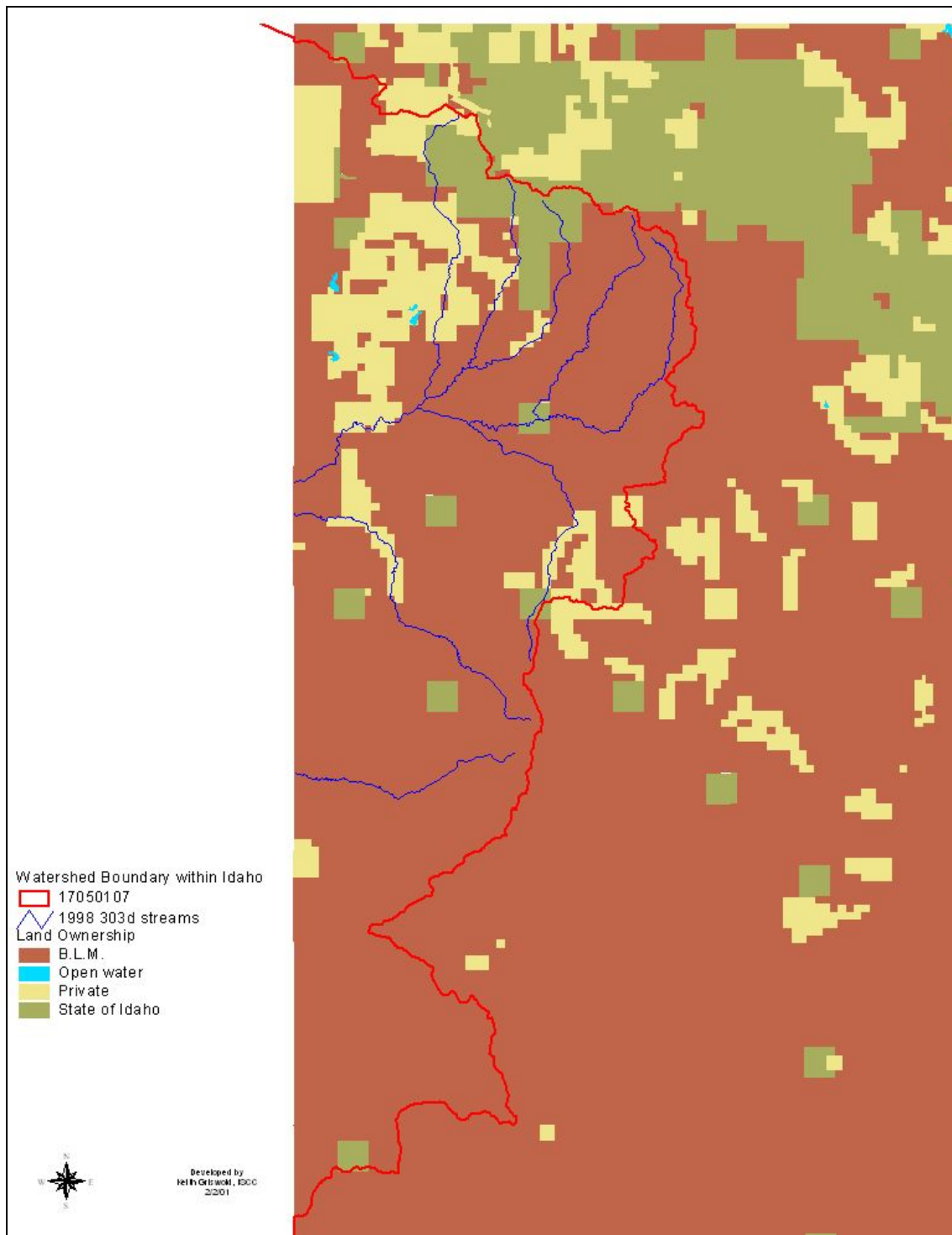


Figure 1. North and Middle Fork Owyhee Fourth Filed Hydrologic Unit Location

Figure 2. North and Middle Fork Owyhee Land Ownership

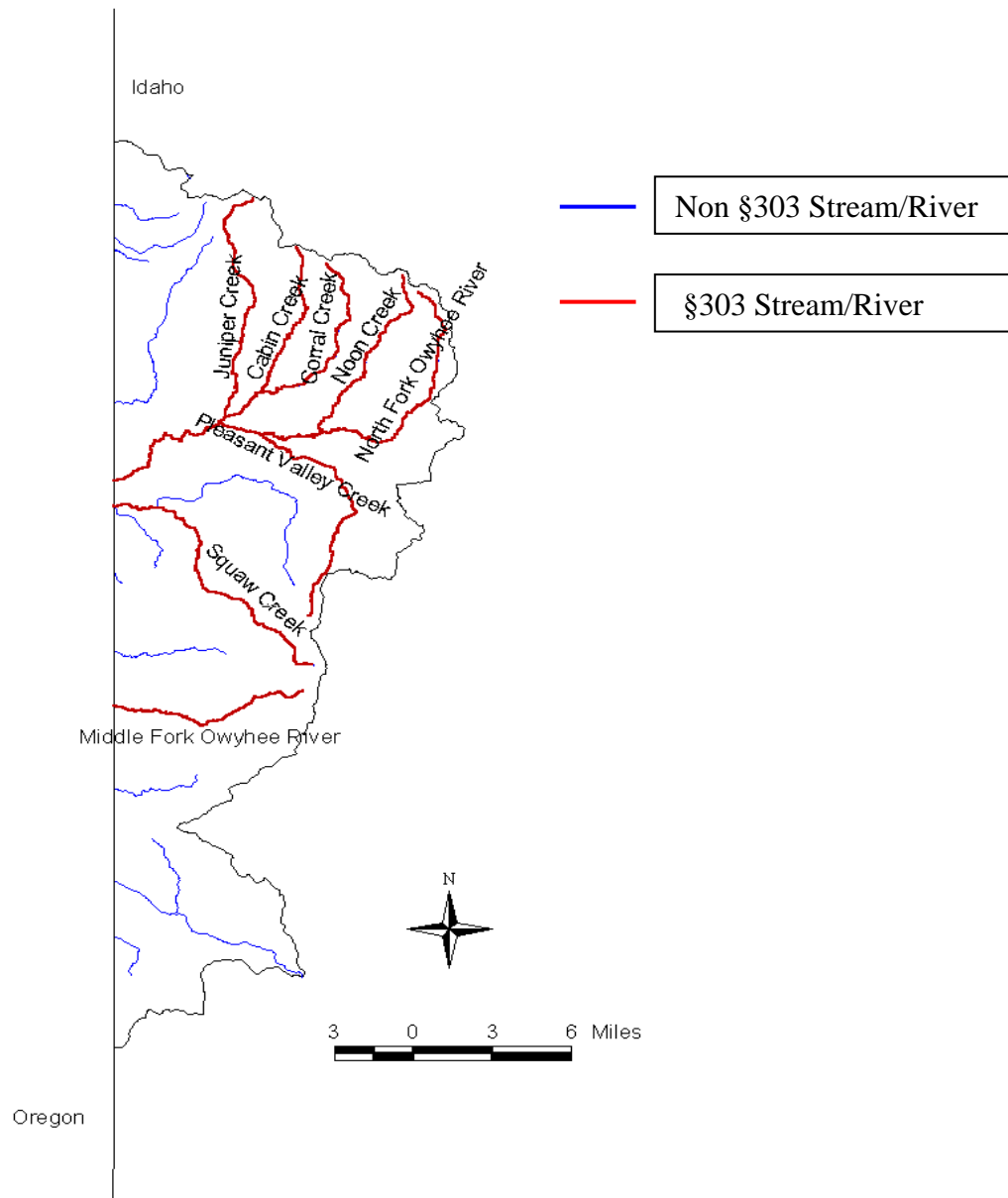


Figure 3. Water Bodies included on the 1998 §303(d) list within the North and Middle Fork Owyhee Hydrologic Unit

Land Use and Ownership

Land uses include grazing with some irrigated hay production by a few private landowners. Recreation uses include day hiking, backpacking, fishing, and hunting. Prior to 1970, both sheep and cattle ran in the North Fork Owyhee drainage. No urban areas are located within the North and Middle Fork subbasins.

Present day landowners (Table 2) within the North and Middle Fork Owyhee hydrologic unit include a few privately owned ranches, federal lands managed by the BLM, and state lands managed by the Idaho Department of Lands (IDL).

Table 2. Ownership for Listed Water Body Drainages

	Area (acres)	BLM (%)	IDL (%)	Private (%)
Total	247,315	75%	11%	14%

Temperature Data, Standard Attainment, and Impacts to Beneficial Uses

Idaho and Oregon stream temperature requirements for cold-water biota, salmonid spawning and salmonid rearing are presented in Table 3.

Table 3. Stream Temperature Criteria for Idaho and Oregon

Aquatic Use ¹	State ²	Standard
Cold Water Biota	Idaho	Must not exceed 72 ⁰ F (22 ⁰ C) at any time or 66 ⁰ F (19 ⁰ C) for the daily average.
Salmonid Spawning	Idaho	Must not exceed 55 ⁰ F (13 ⁰ C) at any time, or 48 ⁰ F (9 ⁰ C) for the daily average.
Salmonid Rearing	Oregon	The seven-day average maximum stream temperature must not exceed 64 ⁰ F (17 ⁰ C) at any time.
Salmonid Spawning	Oregon	The seven-day average maximum stream temperature must not exceed 55 ⁰ (13 ⁰ C) at any time during the identified spawning period.
¹ Salmonid spawning criteria apply during the spawning period only. ² When stream temperatures are above these standards the State of Oregon specifies that “on measurable surface water temperature increase resulting from anthropogenic activities is allowed.” (OAC 340-04100845)		

The predominant anthropogenic (i.e., human) cause of the high stream temperatures is the loss of riparian shade due to grazing impacts. Increases in riparian shade along these water bodies will cause significant reductions in stream temperatures.

IMPLEMENTATION

Point Sources

There are no point sources in the North and Middle Fork Owyhee subbasin.

Nonpoint Sources

Under §319 of the Clean Water Act, each state is required to develop and submit a nonpoint source management plan. The Idaho §319 Nonpoint Source Management Program Plan:

- Identifies programs to achieve implementation of best management practices (BMPs);
- Includes a schedule for program milestones;
- Certified by the State Attorney General;
- Identifies available funding sources; and
- Describes voluntary and regulatory approaches the state will take to abate nonpoint pollution sources.

The State of Idaho uses a voluntary approach to control agricultural nonpoint sources. However, regulatory authority can be found in the water quality standards (IDAPA 58.01.02.350.01 through 58.01.02.350.03). IDAPA 58.01.02.054.07 refers to the Idaho Agricultural Pollution Abatement Plan, which provides direction to the agricultural community and includes a list of approved BMPs. A portion of the Idaho Agricultural Pollution Abatement Plan outlines responsible agencies or elected groups, such as the soil conservation districts, necessary to address nonpoint source pollution problems. For agricultural activity, the Owyhee Soil Conservation District is to assist the landowner with developing and implementing BMPs to abate nonpoint pollution.

If a voluntary approach does not succeed in abating the pollutant problem, the state may seek injunctive relief for those situations that may be determined to be an imminent and substantial danger to public health or environment (IDAPA 58.01.02.350.02(a)). The Idaho water quality standards specify that if water quality standards are not being met, even with the use of BMPs, the state may request that the designated agency evaluate and/or modify the BMPs to protect beneficial uses. If necessary the state may seek injunctive or other judicial relief against the operator of a nonpoint source activity in accordance with Idaho Code (IDAPA 58.01.02.350).

The Bureau of Land Management (BLM) has responsibility for the administration, management and protection of approximately 76% (185,222 acres) of the land in the subbasin. The BLM has authority to regulate, license and enforce land use activities based on:

- Federal Clean Water Act;
- Taylor Grazing Act;
- Federal Land and Policy Management Act;
- Public Rangelands Improvement Act;
- National Environmental Policy Act;
- Emergency Wetlands Resource Act;
- Agricultural Credit Act;
- Land and Water Conservation Act; and
- Executive Orders for Floodplain Management and Protection of Wetlands.

Past management activities by the BLM in this subbasin include, but are not limited to, livestock exclusion from riparian areas, pasture management with planned grazing systems, reservoir development, spring or water development in uplands, and streambank protection through the use of tree revetments. Federal grazing regulations require that the BLM determine if grazing related management practices are achieving the Federal Standards for Rangeland Health for Idaho or are making significant progress toward their achievement and conform with the Guidelines for Livestock Grazing Management.

Temperature Loading Analysis

The current stream temperatures in the North and Middle Fork Owyhee hydrologic unit were determined through continuous stream temperature measurements collected periodically over the past five years. As mentioned, the data showed exceedances of the Idaho and Oregon water quality standards for cold water biota, salmonid rearing, and salmonid spawning.

The North and Middle Fork Owyhee Subbasin Assessment and Total Maximum Daily Load (IDEQ, 1999b) noted that the critical period of the year for cold water biota and salmonid rearing uses is during base flow and high ambient air temperature periods. It also noted that the critical period of the year for salmonid spawning is between March 1 and July 15.

Goals and Objectives for Private Agriculture/Grazing

The purpose of the agricultural/grazing goals and objectives is to protect and enhance the quality of the surface water in the North and Middle Fork Owyhee River subbasins related to private agricultural lands (Table 4). Actions taken as part of the agricultural/grazing goals and objectives can also have a positive affect on ground water quality in the area, which provides base flow for many of the streams and rivers.

Table 4. Private Agricultural Land Use

Landuse	Acres	Percent of watershed
Surface Irrigated Pasture	249	.1%
Riparian Area	325	.1%
Rangeland	33,114	13.8%
Total Private Acres	33,688	14%
Total Watershed Acres	247,315	100%

The Idaho Water Quality Standards (IDAPA 58.01.02.054.07) refers to the Idaho Agricultural Pollution Abatement Plan (Ag Plan), which provides direction to the agricultural community on approved best management practices. The Owyhee Soil Conservation District will act as the lead for implementing best management practices related to agricultural activities. Land treatment through application of a combination of improved irrigation systems, and management practices. Major proposed Best Management Practices (BMPs) include filter strips, critical area plantings, hardened rock crossings, off-site watering facilities, spring development, fencing, irrigation water management, livestock grazing management, and riparian forest buffers.

The costs to install BMPs on agricultural lands are estimated in this plan to provide the local community, government agencies, and watershed stakeholders some perspective on the economic demands of meeting the TMDL goals. Availability of cost-share funds to agricultural producers will be necessary for the success of this plan and the final reduction of pollutants necessary to meet the TMDL requirements. Sources of available funding and technical assistance for the installation of BMPs on private agricultural land are outlined in this document.

It is recommended that landowners within North and Middle Fork Owyhee watershed contact the Owyhee Soil Conservation District (Owyhee SCD), the Natural Resources Conservation Service (NRCS), or the Idaho Soil Conservation Commission (ISCC) to help determine the need to address water quality and other natural resource concerns on their land. This plan is not intended to identify which specific BMPs are appropriate for specific properties, but rather provides a subwatershed

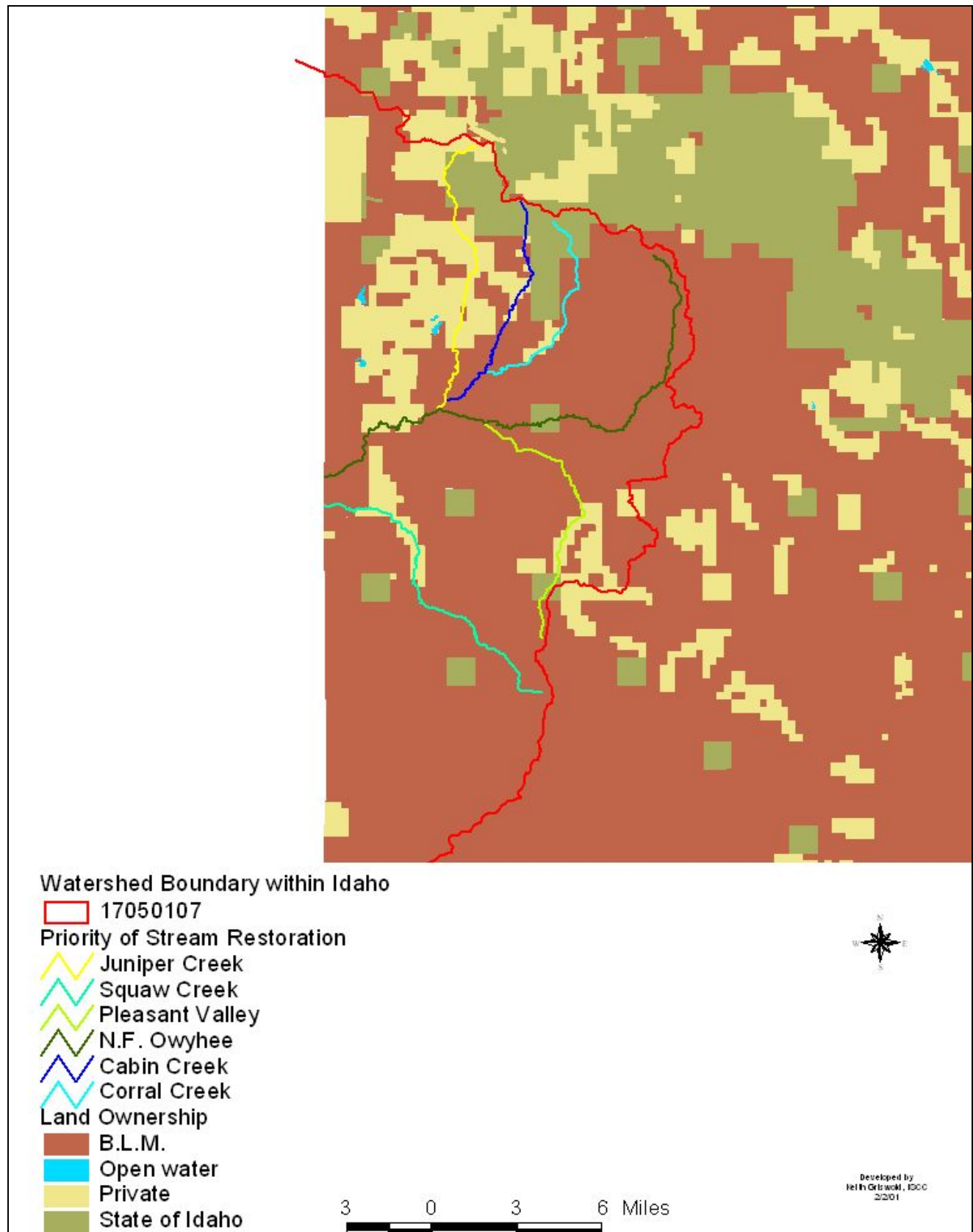
approach for addressing water quality problems attributed to runoff from agricultural lands.

Stream Priority Rating

The following is an Owyhee SCD priority ranking of the streams in the North and Middle Fork Owyhee watershed and included in Table 5 based on the length of stream crossing private land.

Table 5. Stream Restoration Priority for Private Agricultural Lands

Stream Priority	Stream Name	Perennial Miles	Intermittent Miles
1	Juniper Creek	5.9	2.4
2	Squaw Creek	4.1	1.2
3	Pleasant Valley Creek	2.9	3.2
4	North Fork Owyhee River	2.5	0
5	Cabin Creek	2.4	0
6	Corral Creek	1.6	0.6
	Total Private Stream Miles	19.4	7.4

Figure 4. North and Middle Fork Owyhee Watershed Stream Priorities

This section presents information on the individual agricultural land uses within the watershed. Each land use is divided into one or more Treatment Units (TUs) (Figure 5). The TUs describe areas with similar use, management, soils, productivity, resource concerns, and treatment needs. The TUs not only provide a method for delineating and describing land use but are also used in evaluating land use impacts to water quality and in the formulation of alternatives for solving the identified problems.

The descriptions in this section are intended to provide a general overview of the TUs.

- Treatment Unit #1 – Surface Irrigated Pasture/Hayland, 249 acres
Surface irrigated pasture and hayland is present on Juniper Creek, Squaw Creek, and Pleasant Valley Creek. The water is diverted out of a waterbody and applied through ditches and surface irrigation.
- Treatment Unit #2 – Riparian area, 325 acres
This treatment unit is the length in feet of intermittent and perennial streams times 100 feet for the width of a riparian buffer.
- Treatment Unit #3 -- Rangeland, 33,114 acres
Rangeland pasture occurs on private lands throughout the watershed. The pastures vary in grass health and juniper invasion.

Description of Alternatives

Alternative 1: No action (possible future without voluntary landowner participation)

This alternative consists of continuing on with the present existing conservation programs. These programs would in no way address the water quality problems in the North and Middle Fork Owyhee watershed. Water temperature rates would remain constant or slowly decrease, as would the delivery of sediment. These continuing or decreasing problems may likely lead to greater impacts to the existing beneficial uses of these waters, which could lead to mandatory landowner participation.

Alternative 2: Land treatment with improved irrigation systems, sediment and nutrient control systems and management practices (BMPs with voluntary landowner participation)

This alternative was formulated to reduce stream temperatures, contain and filter sediment, improve riparian vegetation and wildlife habitat. This will improve the quality of surface waters in the project area and reduce pollutant loading to the North and Middle Fork Owyhee watershed. The status of the beneficial uses for these waters will be maintained or improved with the implementation of this alternative.

Agricultural conservation and soil erosion practices are typically referred to as Best Management Practices (BMPs). These practices are nationally derived systems to control, reduce, or prevent soil erosion and sedimentation and stream temperatures on agricultural landuses (APAP, 1991). The BMPs planned under this alternative are included on Tables 6, 7, and 8. Tables 9 and 10 illustrate the types of BMPs that might be implemented based on costs.

Table 6. Treatment Unit 1 - BMPs for Irrigated Hayland/Pasture

Draft Report	Draft Report	Draft Report
Irrigation System	Fencing	
Irrigation Water Management	Structure for Water Control	
Offsite watering	Filter strips	
Livestock Watering Facility	Nutrient Management	
Pasture and Hayland Planting	Pasture and Hayland Management	
Irrigation Water Conveyance		

Table 7. Treatment Unit 2 - BMPs for Riparian Areas

Fencing	Heavy use area protection
Wildlife Upland Habitat Management	Critical Area Planting
Planned Grazing System	Riparian Buffer
Livestock Watering Facility	

Table 8. Treatment Unit 3 - BMPs for Rangeland

Fencing	Wildlife Upland Habitat Management
Offsite watering	Brush Management
Spring water development	Rangeland Seeding
Planned Grazing System	Livestock Watering Facility
Prescribed Burning	Trough or Tank
Water Harvesting Catchment	

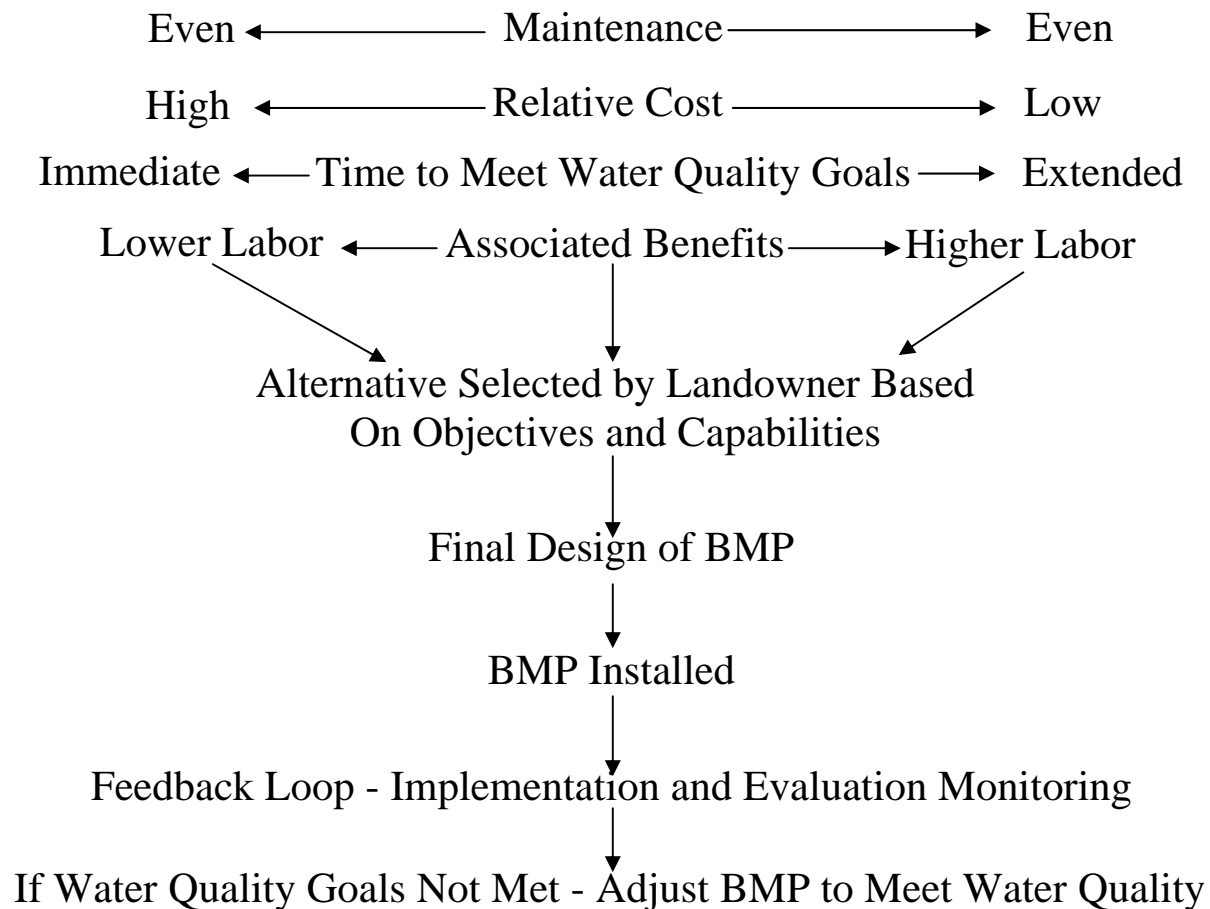
The following example illustrates a description of alternatives for surface irrigated hayland/pasture areas under the following scenario:

Example 1 Situation: Beneficial Use Impaired---Cold Water Biota
Pollutant---Temperature
Source---Poor Irrigation Water Management.
Landuse---Hayland/pasture

Procedure: Conduct Resource Inventory and Site Assessment, Evaluate Data to Develop Site Specific BMP Alternatives.

Table 9. Example of Site Specific BMP for Surface Irrigated Hayland/Pasture

SITE SPECIFIC BMP Alternative #1 (\$500/ acre)	SITE SPECIFIC BMP Alternative #2 (\$400/ acre)	SITE SPECIFIC BMP Alternative #3 (\$325/acre)
Fencing	Fencing	Fencing
Planned Grazing System	Planned Grazing System	Pasture & Hayland Management
Pasture & Hayland Management	Pasture & Hayland Management	Nutrient Management
Nutrient Management	Nutrient Management	Filter Strip
Livestock Watering Facility	Livestock Watering Facility	Livestock Watering Facility
Irrigation Water Management	Irrigation Water Management	Irrigation Water Management
Gated Pipe	Gated Pipe	
Heavy Use Area Protection		



The following example illustrates a description of alternatives for riparian areas under the following scenario:

Example 2 Situation: Beneficial Use Impaired---Cold Water Biota

Pollutant---Temperature

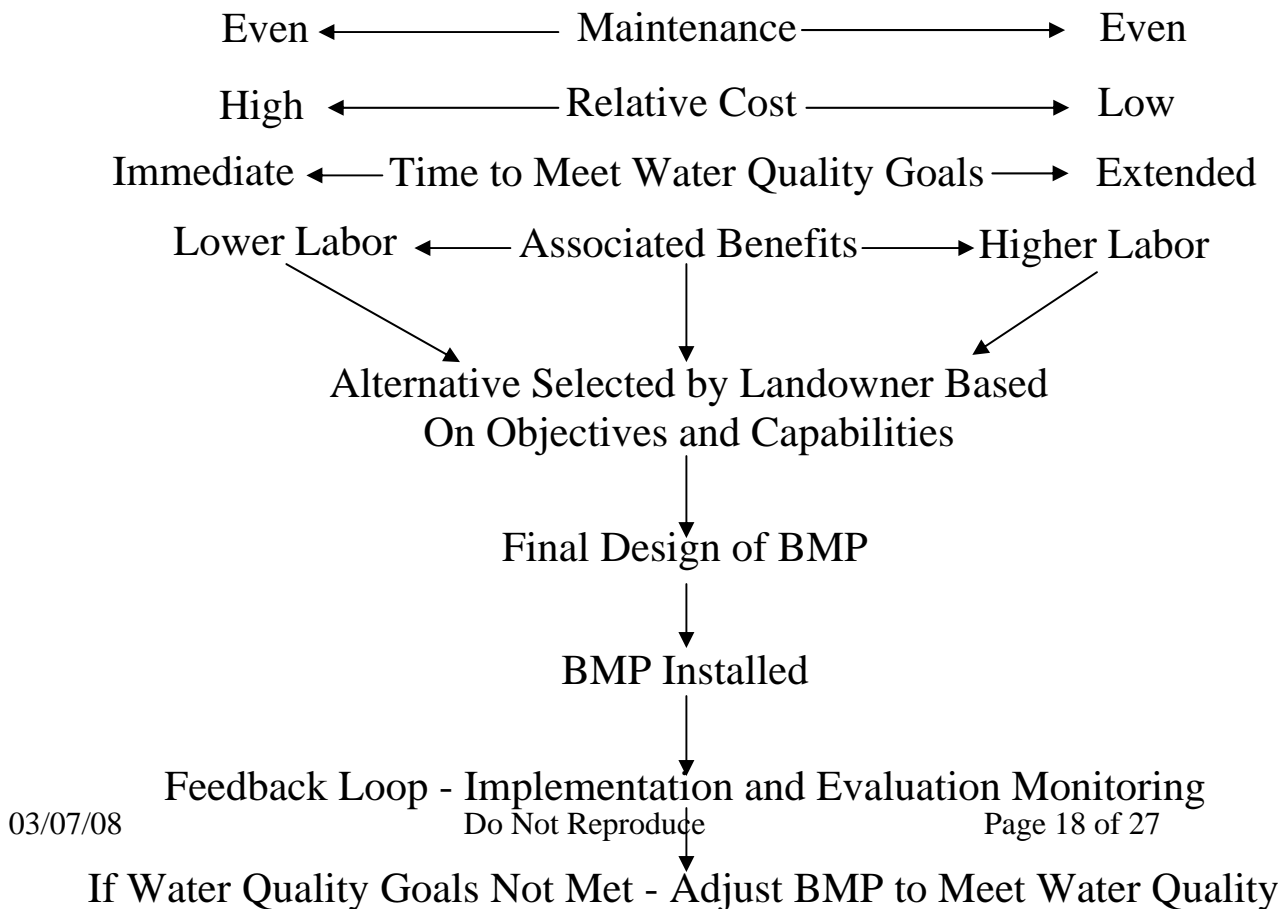
Source---Unmanaged livestock access to perennial and intermittent streams

Landuse---Grazing

Procedure: Conduct Resource Inventory and Site Assessment, Evaluate Data to Develop Site Specific BMP Alternatives.

Table 10. Example of Site Specific BMPs for Riparian Areas

SITE SPECIFIC BMP Alternative #1 (\$350/ acre)	SITE SPECIFIC BMP Alternative #2 (\$250/ acre)	SITE SPECIFIC BMP Alternative #3 (\$150/ acre)
Fencing	Fencing	Fencing
Planned Grazing System	Planned Grazing System	Planned Grazing System
Heavy Use Area Protection	Heavy Use Area Protection	Heavy Use Area Protection
Livestock Watering Facility	Livestock Watering Facility	
Critical Area Planting		
Riparian Buffer		
Wildlife Upland Habitat Management.		



Alternative Selected

The Owyhee Soil Conservation District selected Alternative 2, land treatment through application of a combination of structural, nutrient and sediment control systems, and management practices.

Alternative 2 will meet the District's objectives by reducing water quality degradation of North and Middle Fork Owyhee watershed.

The selected alternative is a combination of BMPs that will:

- Improve the water quality of North and Middle Fork Owyhee watershed.
- Reduce the sedimentation of North and Middle Fork Owyhee waterbodies.
- Improve riparian vegetation and wildlife habitat.

Alternative Elements

The state of Idaho has adopted the voluntary approach of getting nonpoint source landowners to help meet water quality goals. If a voluntary approach does not succeed in abating the pollutant problem, the state may seek injunctive relief for those situations that may be determined to be an imminent and substantial danger to public health or environment (IDAPA 16.01.01.350.02(a)).

BMP application to the critical acres will be variable, depending on the need for water quality improvements. The BMPs needed for any resource and water quality improvements will be presented to the participant with an incentive to adopt higher management level BMPs above what is required to participate.

Not all BMPs will be required for each level of management on all acres under the control of the participant. Only those combinations of BMPs needed for water quality improvements, which are feasible to the participant, will be implemented.

Installation and Financing

The USDA Natural Resources Conservation Service (NRCS) is the technical agency that will assist the Idaho Soil Conservation Commission (ISCC) and Owyhee SCD in developing water quality plans and designs and assist with BMP installation, utilizing standards and specifications contained in the NRCS Field Office Technical Guide. NRCS and ISCC will assist Owyhee SCD with certification of installed BMPs, filing payment applications, completion of annual status reviews on contracts, annual development of an average cost list, and will provide any needed follow-up assistance such as that required for contract modification.

Each participant will be responsible for installing the BMPs scheduled within their contract as planned in the Conservation Plan. Any needed land rights, easements or permits necessary for construction and inspection will be the sole responsibility of the participant. Each participant will also be required to make their own arrangements for financing their share of installation costs. Tables 11 and 12 illustrate the estimated costs associated with implementing each alternative.

Table 11. Estimated BMP Costs for Treatment Unit 1

Alternative	Acres	Total Costs
Alternative 1 - \$500/Acre	249	\$124,500
Alternative 2 - \$400/Acre	249	\$99,600
Alternative 3 - \$325/Acre	249	\$80,925

Table 12. Estimated BMP Cost for Treatment Unit 2

Alternative	Acres	Total Costs
Alternative 1 - \$325/Acre	325	\$113,750
Alternative 2 - \$250/Acre	325	\$81,250
Alternative 3 - \$150/Acre	325	\$48,750

Operation, Maintenance, and Replacement

Participants will be required to maintain the installed BMPs for the life of their contract. The contract will outline the responsibility of the participant regarding operation and maintenance (O&M) for each BMP. The NRCS and ISCC will provide technical assistance for the installation of BMPs.

Inspections of installed BMPs will be made on an annual basis by Owyhee SCD, NRCS, ISCC and the participant during the life of the contract. The intent is to develop a system of BMPs that will protect water quality and is socially and economically feasible to the participant. By accomplishing this objective, it is intended that the BMPs will become a part of the participant's farming operation and will continue to be operated and maintained after the contract expires.

Administrative and Input Needs and Costs

The estimates based on the projected practice application, and the final costs will be those actually incurred at the time of installation. Installation costs will be shared by the individual landowners and through other funding sources. Technical and financial resources will focus on installation of BMPs in critical areas.

Project administration includes all administration costs associated with the installation of the selected alternative. These costs include the review and approval of conservation plans (contracts), administration of the water quality contracts and supervision of BMP application.

In order to meet the previously identified objectives, the Owyhee SCD will serve as the administrative agency responsible for implementation of the selected alternative on private agricultural lands. Approximately 10% of the total estimated costs for BMP installation was used to estimate the cost for administration. The following actions will be taken by the district to support the administrative responsibility:

- Balanced program which is technically feasible and socially and economically acceptable to the land users in the project area; and
- Development of conservation plans on critical acres in conjunction with land user/operators willing to adopt management systems and incorporate the recommended BMPs.

Technical Assistance Needs

The following technical assistance (TA) needs are based on implementing water quality BMPs throughout the entire watershed. The TA staff years needed are based on 1 staff years for the watershed. A half time planner with technical engineering abilities to develop and administer contracts is needed to complete the tasks listed below.

Private Agricultural - Tasks (Example Only)

Task 1: Develop conservation plans and contracts on 66% of Treatment Unit 1 Lands and 50% of Treatment Unit 2 Lands for private agriculture lands

Milestone 1: October 2003

Responsible Agency: Idaho Soil Conservation Commission and Natural Resources Conservation Service

Task 2: Start implementing contracts on private agriculture lands

Milestone 2: October 2004

Responsible Agency: Private land Owners

Task 3: Develop conservation plans and contracts on remainder of Treatment Unit 1 Lands and Treatment Unit 2 Lands for private agriculture lands

Milestone 3: October 2005

Responsible Agency: Idaho Soil Conservation Commission and Natural Resources Conservation Service

Task 4: Continue implementing contracts on private agriculture lands

Milestone 4: October 2006

Responsible Agency: Idaho Soil Conservation Commission and Natural Resources Conservation Service

Task 5: Perform annual status review on BMPs installed on private agricultural land

Milestone 5: In association with individual contracts

Responsible Agency: Idaho Soil Conservation Commission & Owyhee Soil Conservation District

Monitoring Plan

The IDEQ will continue to utilize the BURP monitoring and Waterbody Assessment process to determine overall improvements to the subbasins and to determine when all beneficial uses are being fully attained.

Goals and Objectives for Federal Lands

To protect and enhance both the quality of the surface and ground water in the North and Middle Fork Owyhee River subbasins by developing a detailed grazing implementation plan to meet State Water Quality Standards criteria on the North and Middle Fork Owyhee River.

(This section should contain the text related to the work plan and implementation for Federal lands)

Goals and Objectives for State Lands

To protect and enhance both the quality of the surface and ground water in the North and Middle Fork

Draft Report

Draft Report

Draft Report

Owyhee River subbasins by developing a detailed grazing implementation plan to meet State Water Quality Standards criteria on the North and Middle Fork Owyhee River.

(This section should contain the text related to the work plan and implementation for State lands)

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Glossary of Terms and Acronyms

Aquifer - A water-bearing bed or stratum of permeable rock, sand, or gravel capable of yielding considerable quantities of water to wells or springs.

Antidegradation - A federal regulation requiring the States to protect high quality waters. Water Quality Standards may be lowered to allow important social or economic development only after adequate public participation. In all instances, the existing beneficial uses must be maintained.

Aquatic - Growing, living, or frequenting water.

Assimilative Capacity - An estimate of the amount of pollutants that can be discharged to a water body and still meet the state water quality standards. It is the equivalent of the Loading Capacity, which is the equivalent of the TMDL for the water body.

Bedload - Sand, silt, gravel, or soil and rock detritus carried by a stream on or immediately above (3") its bed.

Beneficial Use - Any of the various uses which may be made of the water of an area, including, but not limited to, domestic water supplies, industrial water supplies, agricultural water supplies, navigation, recreation in and on the water, wildlife habitat, and aesthetics.

Best Management Practice (BMP) - A measure determined to be the most effective, practical means of preventing or reducing pollution inputs from point or nonpoint sources in order to achieve water quality goals.

Biomass - The weight of biological matter. Standing crop is the amount of biomass (e.g., fish or algae) in a body of water at a given time. Often measured in terms of grams per square meter of surface.

Biota - All plant and animal species occurring in a specified area.

Coliform bacteria - A group of bacteria predominantly inhabiting the intestines of man and animal but also found in soil. While harmless themselves, coliform bacteria are commonly used as indicators of the possible presence of pathogenic organisms.

Designated Beneficial Use or Designated Use - Those beneficial uses assigned to identified waters in Idaho Department of Health and Welfare Rules, Title 1, Chapter 2, "Water Quality Standards and Wastewater Treatment Requirements:, Sections 110. through 160. and 299., whether or not the uses are being attained.

Erosion - The wearing away of areas of the earth's surface by water, wind, ice, and other forces.

Existing Beneficial Use or Existing Use - Those beneficial uses actually attained in waters on or after November 28, 1975, whether or not they are designated for those waters in Idaho Water Quality

Standards and Wastewater Treatment Requirements (IDAPA 58).

Exotic Species - Non-native or introduced species.

Feedback Loop - A component of a watershed management plan strategy that provides for accountability on targeted watershed goals.

Flow - The water that passes a given point in some time increment.

Groundwater - Water found beneath the soil's surface; saturates the stratum at which it is located; often connected to surface water.

Habitat - A specific type of place that is occupied by an organism, a population or a community.

Headwater - The origin or beginning of a stream.

Hydrologic basin - The area of land drained by a river system, a reach of a river and its tributaries in that reach, a closed basin, or a group of streams forming a drainage area. There are six basins described in the Nutrient management Act (NMA) for Idaho -- Panhandle, Clearwater, Salmon, Southwest, Upper Snake, and the Bear Basins.

Hydrologic cycle - The circular flow or cycling of water from the atmosphere to the earth (precipitation) and back to the atmosphere (evaporation and plant transpiration). Runoff, surface water, groundwater, and water infiltrated in soils are all part of the hydrologic cycle.

LA - Load Allocation for nonpoint sources.

Limiting - A chemical or physical condition that determines the growth potential of an organism, can result in less than maximum or complete inhibition of growth, typically results in less than maximum growth rates.

Load Allocation - The amount of pollutant that nonpoint sources can release to a water body.

Loading - The quantity of a substance entering a receiving stream, usually expressed in pounds (kilograms) per day or tons per month. Loading is calculated from flow (discharge) and concentration.

Loading Capacity - A mechanism for determining how much pollutant a water body can safely assimilate without violating state water quality standards. It is also the equivalent of a TMDL.

Macro invertebrates - Aquatic insects, worms, clams, snails, and other animals visible without aid of a microscope, that may be associated with or live on substrates such as sediments and macrophytes. They supply a major portion of fish diets and consume detritus and algae.

Macrophytes - Rooted and floating aquatic plants, commonly referred to as water weeds. These plants may flower and bear seed. Some forms, such as duckweed and coontail (*Ceratophyllum*), are free-floating forms without roots in the sediment.

Margin of safety (MOS) - An implicit or explicit component of water quality modeling that accounts for the uncertainty about the relationship between the pollutant loads and the quality of the receiving water body. This accounts for any lack of knowledge concerning the relationship between pollutant loads and the water quality of the receiving water body. It is a required component of a TMDL and is normally incorporated into the conservative assumptions used to develop the TMDL (generally within the calculations or models) and is approved by the EPA either individually or in State/EPA agreements. Thus, the $TMDL = LC = WLA + LA + MOS$.

National Pollution Discharge Elimination System (NPDES) - A national program from the Clean Water Act for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcement permits, and imposing and enforcing pretreatment requirements.

Nonpoint Source - A geographical area on which pollutants are deposited or dissolved or suspended in water applied to or incident on that area, the resultant mixture being discharged into the waters of the state. Nonpoint source activities include, but are not limited to irrigated and nonirrigated lands used for grazing, crop production and silviculture; log storage or rafting; construction sites; recreation sites; and septic tank disposal fields.

Reach - A continuous unbroken stretch of river.

Riparian vegetation - Vegetation that is associated with aquatic (streams, rivers, lakes) habitats.

Runoff - The portion of rainfall, melted snow, or irrigation water that flows across the surface or through underground zones and eventually runs into streams.

Sediment - Bottom material in a body of water that has been deposited after the formation of the basin. It originates from remains of aquatic organism, chemical precipitation of dissolved minerals, and erosion of surrounding lands.

Sub-watershed - Smaller geographic management areas within a watershed delineated for purposes of addressing site specific situations.

Threatened species - A species, determined by the U.S. Fish and Wildlife Service, which are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

TMDL - Total Maximum Daily Load. $TMDL = LA + WLA + MOS$. A TMDL is the equivalent of the Loading Capacity which is the equivalent of the assimilative capacity of a water body.

Total suspended solids (TSS) - The material retained on a 45 micron filter after filtration

Tributary - A stream feeding into a larger stream or lake.

Waste Load Allocation - The portion of receiving water's loading capacity that is allocated to one of its existing or further point sources of pollution. It specifies how much pollutant each point source can

release to a water body.

Water Pollution - Any alteration of the physical, thermal, chemical, biological, or radioactive properties of any waters of the state, or the discharge of any pollutant into the waters of the state, which will or is likely to create a nuisance or to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to fish and wildlife, or to domestic, commercial, industrial, recreational, aesthetic, or other beneficial uses.

Water Quality Management plan - A state or area-wide waste treatment plan developed and updated in accordance with the provisions of the Clean Water Act.

Water Quality limited segment (WQLS) - Any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards.

Water table - The upper surface of groundwater; below this point, the soil is saturated with water.

Watershed - A drainage area or basin in which all land and water areas drain or flow toward a central collector such as a stream, river, or lake at a lower elevation. The whole geographic region contributing to a water body.

WLA - Wasteload Allocation for point sources.

Useful Conversion Factors

1 meter = 3.821 feet 1 hectare = 0.4047 acre $^{\circ}\text{C} = (^{\circ}\text{F} - 32)/1.8$